

ACCE Position Paper on ICT in the Australian Curriculum

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This paper was prepared for the Australian Council for Computers in Education and represents the views of that Council and its affiliates: CEGSA, ECAWA, ICTENSW, ICTEV, ITEANT, QSITE, TASITE, and The Australian Computer Society. It also represents the views of VITTA.

Consultation

ACCE would like to thank its member associations: CEGACT, CEGSA, ECAWA, ICTENSW, ICTEV, ITEANT, QSITE, TASITE, and The Australian Computer Society for their contribution to this paper. It also acknowledges the contribution of VITTA (The Victorian Information Technology Teachers' Association). The position represented here is truly a national teachers' association position on a very important issue.

ACCE would like to recognise the committee that coordinated the consultation and developed the paper on behalf of ACCE: Dr Nicholas Reynolds (chair), Paula Christophersen, Phil Callil and Helen Otway.

Current position

The Melbourne Declaration recognises the importance of ICT as being 'central to Australia's skilled economy (requiring) crucial pathways to post-school success' (MCEETYA, 2008). It specifies Information and Communication Technology and Design and Technology as one of the eight learning areas of the Australian curriculum. The Melbourne Declaration makes particular mention of the role of ICT in supporting learning in all curriculum areas.

The Australian Curriculum as presented by ACARA acknowledges the interdisciplinary role of ICT by defining its role as a General Capability (GC) and its specific role as a discipline by placing Information and Communication Technology into the ICT and Design and Technology Learning Area. This position paper argues that the current articulation of ICT as both a GC and as part of the so called 'Technologies' Learning Area does not support the development of digital literacy, does not provide enough rich ICT use to develop essential pathways and does not support the creation of a digitally productive, knowledge based society.

This paper argues that ICT needs to be its own learning area, either within the framework of the ICT and Design and Technology Learning Area, or as a new area. This notion is not alien to the spirit of the Melbourne Declaration. In that document the term 'Humanities and social sciences (including history, geography, economics, business, civics and citizenship)' is used to define one Learning Area, yet in the first phase of the Australian Curriculum, History is presented as a standalone Learning Area, as is Geography, a phase two learning area.

As a learning area, work is just beginning on determining ICT's conceptual 'home' and its content. In December 2010, a group of experts representing areas ('contexts') such as ICT, design and technology, systems engineering, primary industries, food and technology and textiles met at ACARA to discuss what in essence comprises a technologies learning area. ACCE was represented at that meeting. One key issue raised at the meeting was the role of the 'Design Process Framework' in defining what constitutes Technology education. At that meeting significant emphasis was placed on the Technology Education Network's 2010 draft position paper (TEN 2010). The design process framework is the underlying theoretical framework in that document and is now guiding curriculum development for ACARA in the ICT and Design and Technology Learning Area. That paper, while recognising that ICT is part of a broad learning area, devalues the importance of ICT by referring to

the learning area as the 'Technologies' learning area, rather than as Information and Communication Technologies and Design and Technology.

Another area of concern with the so called 'Technologies' Learning Area discussion, both in the TEN draft proposal and in ACARA working papers for the December meeting, is the extended use of the term 'technacy'. This term is of little value to the debate and further enshrines the design process framework. The term limits the scope of ICT and fails to acknowledge its unique qualities and complexities. ACCE is strongly opposed to its use in any attempt to describe desired outcomes in ICT learning and application in schools and society.

Currently there is no published curriculum documentation for ICT competence as a GC. Rather its place in the Australian Curriculum is recognised within each of the four published learning areas, English, Mathematics, Science and History through embedding in content descriptions and/or achievement standards and through an introductory paragraph explaining the role of ICT in that learning area.

Concerns with current position

There are concerns relating to:

- the curriculum articulation of ICT competence as a GC
- the developmental pathways of ICT as a learning area
- the relationship between both ICT competence and ICT as a learning area
- removal of reference to ICT in the Technologies Learning Area – should be Information and Communication Technologies, and Design and Technology

Curriculum articulation of ICT competence

The term 'competence' is of interest. The European Qualification Framework (EQF, 2008) defines competence as 'the proven ability to use knowledge, skills and personal, social and/ or methodological abilities, in work or study situations and in professional and personal development'. In the same context, knowledge is defined as 'the outcome of the assimilation of information through learning' and skill as 'the ability to apply knowledge and use know-how to complete tasks and solve problems' (p. 11).

The understanding of competence in this way demonstrates that ICT competence is a significantly more important set of attributes than those articulated within the current General Capabilities documentation. True ICT competence will support the shift to a knowledge-based society. It addresses the need for all students to acquire and apply a depth and breadth of ICT knowledge, skills, attitudes, values and ethics in order for them to be successful learners, workers and active citizens. True ICT competence will result in a digitally literate, digitally fluent and digitally productive society. This can only be achieved through clearly articulated and developmentally appropriate curriculum and standards.

International research is conclusive in stating that the curriculum must be clear about expectations by establishing standards. The conceptual basis on which all general capabilities are built is a continuum – there are no achievement standards, but rather broad statements of learning at varying year intervals. For ICT competence this is years 2, 6 and 10, however for Literacy and Numeracy they are at years 2, 4, 6, 8 and 10. The audience for these continua was the writers of the learning areas for the purpose of determining how the GCs could be embedded, not for teachers implementing the curriculum. In English and Mathematics standards are articulated in year-to-year levels and in Science and History they are in two year bands.

Effective learning does not usually occur through osmosis; rather teachers must be clear about what students need to learn and what indicates success in learning. The content to be covered and the skills to be developed must be clearly stated so that developmentally progressive learning programs can be designed by schools. This in turn supports informed decision making about measuring and reporting student progress.

Most embedding instances of ICT in the learning areas are typically devoid of any standards, for example, Year 10 History achievement standard reads 'They identify and locate both primary and secondary sources using information technologies ...'. This provides no indication of the ICT knowledge and skills required to find information that meets its purpose.

Developmental pathways of ICT as a learning area

There is a body of knowledge associated with ICT that is not covered in other learning areas. Typically this content focuses on the characteristics of data, people, procedures and electronic equipment and how they interact to create structured information. This knowledge and these skills form the educational and career pathways to supporting the digital economy. Developmental pathways, both from the compulsory to the post compulsory years, and beyond formal schooling need to be obvious in the curriculum. Australian education needs to reinvigorate ICT career pathways but at the same time strengthen the use and integration of ICT to support powerful learning and teaching.

From a curriculum perspective, design tools and design elements are usually covered in 'dedicated' ICT offerings, but the application of a 'design process' framework, as discussed at the December meeting at ACARA, is not a fundamental underpinning of ICT. While structural processes suit many ICT areas, a primary focus on the Design Process Framework can be limited and limiting for ICT. Being able to exploit the capabilities of ICT to engage in risk-taking and tinkering are intrinsic qualities of ICT that appear incompatible with a structured problem-solving approach.

This misalignment with a key criterion that defines the 'Technologies' Learning Area, together with the key role that ICT plays in learning and everyday life, makes ICT beyond a single context within the 'Technologies' Learning Area.

Relationship between both ICT competence (GC) and ICT as a learning area

By placing ICT as a context within the Technologies Learning Area and having it as a general capability, confusion is created about their relationships. When planning teaching and learning programs, teachers must be clear about the expectations of students. Is there a hierarchical order? When do they overlap? Teachers should not be expected to refer to two different curriculum documents with different constructs and status, draw connections and then plan a teaching and learning program. Currently a similar situation exists with Literacy; there is a literacy strand within English and a Literacy general capability, and it is understood that their content is very similar. ACARA is aware of the tensions regarding this relationship.

The Information and Communication Technology general capability currently embedded in the Australian Curriculum signals limited specific ICT capabilities appropriate to and within the range of disciplines developed to date.

The implementation of an Information and Communication Technology discipline within the Information and Communication Technology and Design and Technology Learning Area or as a

separate Learning Area must provide an authentic pathway of Information and Communication Technology capability development for students in F-12.

Curriculum Terminology

The long and cumbersome title, Information and Communication Technologies and Design and Technology, has already shown itself to be unworkable. It could be argued that it is just a name, but this is not a valid argument. ICT has been effectively subsumed by the reference to the Information and Communication Technologies and Design and Technology Learning Area as 'Technologies'. The devaluing of this key area in education and in national capacity building has significant implications for the effective teaching of and learning with ICT in all years of schooling.

Solution requirements

To service the needs of ICT being both a general capability and a learning area, the solution requires the following features:

- Clear articulation of the content to be covered and achievement standards so that progress in learning can be measured and reported, whether as a general capability or as a discipline
- ICT pathways that are obvious through curriculum content
- Two-year intervals of content and achievement standards that assist in mapping learning and progress, in line with Literacy and Numeracy.


Proposed solution

In order to meet the solution requirements, the following is proposed:

- One learning area, provisionally titled ICT. This models the approach taken with History and Geography, which are separate learning areas under the conceptual banner of the Humanities. This learning area will comprise **two** strands:
 - ICT competence:
 - Standards are articulated within the Information and Communication Technologies Learning Area, but which map and support the ICT general capability.
 - Standards can be achieved and/or demonstrated through other learning areas
 - Digital Technologies (provisional title):
 - Maps specific ICT knowledge and skills relating to a deeper study of ICT. See figure 1: Construct of ICT Learning Area
- The ICT competence strand to be articulated in two-year intervals, with content descriptors and standards at Years 2, 4, 6, 8 and 10. These support the acquisition and demonstration of knowledge and skills relating to a range of learning areas. These descriptors and standards will be accompanied by elaborations showing rich applications.
- The Digital Technologies strand to be articulated in two-year intervals with specific content descriptors and standards that deepen at Years 8 and 10. These will be accompanied by elaborations showing rich applications.

Information and Communication Technology Learning Area

| Digital Technologies (content descriptors and achievement standards) | ICT competence (content descriptors and achievement standards) | Level |
|--|--|-------|
| | | 2 |
| | | 4 |
| | | 6 |
| | | 8 |
| | | 10 |
| | | 12 |

 Content descriptors and achievement standards (increase in depth of content represented by darkness of shading)

Key:

Figure 1: Construct of ICT Learning Area

Advantages of this proposal

- Articulation in one curriculum document facilitates the incorporation of ICT in all areas of curriculum planning. If ICT is incorporated as a context within the Technologies Learning Area as well as being documented as a General Capability, the curriculum design pathways would be very unclear, as would the difference in their status, namely that a learning area has content descriptors and achievement standards and a GC has nothing, except for isolated instances of embedding.
- There will be a reference point for elaborating what is meant by instances of embedding in other learning areas. For example, for the Year 10 History achievement standard, teachers would know what ICT knowledge and skills are expected to be acquired and demonstrated at that level.

Conclusion

ICT is best documented as a single entity. This facilitates ease of use and consolidates its status. In today's digital economy it is crucial to minimise the new digital divide, premised on the capacity of people to add value to the plethora of available information through the application of ICT knowledge and skills. A significant contribution to this would be the explicit statement of content and standards required for all students to be successful learners, active citizens, and digitally productive and versatile workers.

References

TEN (2010) *The Information and Communication Technology and Design and Technology learning area discussion paper*, Technology Education network February 2010. www.datta.vic.edu.au/resources/discussion_paper_tec2.pdf

Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) (2008) *Melbourne Declaration on Educational Goals for Young Australians*, Canberra.

(EQF) (2008) *The European Qualifications Framework for lifelong learning* http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm